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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/961,281	09/25/2001	Toshiaki Aoai	Q66351	6134

7590 09/03/2003
SUGHRUE, MION, ZINN, MACPEAK & SEAS PLLC
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Washington, DC 20037

EXAMINER

ASHTON, ROSEMARY E

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/961,281

Applicant(s)

AOAI ET AL.

Examiner

Rosemary E. Ashton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,6,7 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 4,5 and 8-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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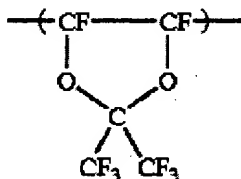
DETAILED ACTION***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

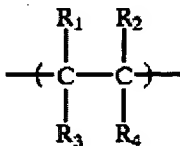
2. Claims 1-3,6,7,17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim U.S. patent application publication US 2002/0177067 of application 09/947,582 filed 9/6/01.

Kim teaches a fluoro polymer for a photoresist composition. As shown in the abstract the polymer has a perfluoro-2,2-dimethyl-1,3-dioxol monomer, shown below, which has fluorine atoms in the backbone and pendant to the backbone.



perfluoro-2,2-dimethyl-1,3-dioxol 1

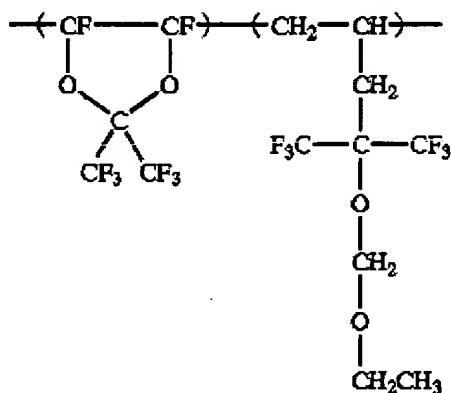
An additional monomer in the polymer is a vinyl derivative, shown below, wherein R4 is preferably an acid labile group with acetal groups having fluoro substituents (section 40) such as the polymer in Example 2, below.



vinyl derivative 1

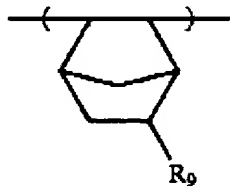
Synthesis of Copolymer

[0104] The synthesized copolymer can be represented by the following formula:



Another monomer is a norbornene derivative, below, wherein R9 is preferably an acid labile group with acetal groups having fluoro substituents (section 21,22) such as the polymer in Example 8, below, wherein R9 is preferably an acid labile group with acetal groups having fluoro substituents such as the polymer in Example 8, below.

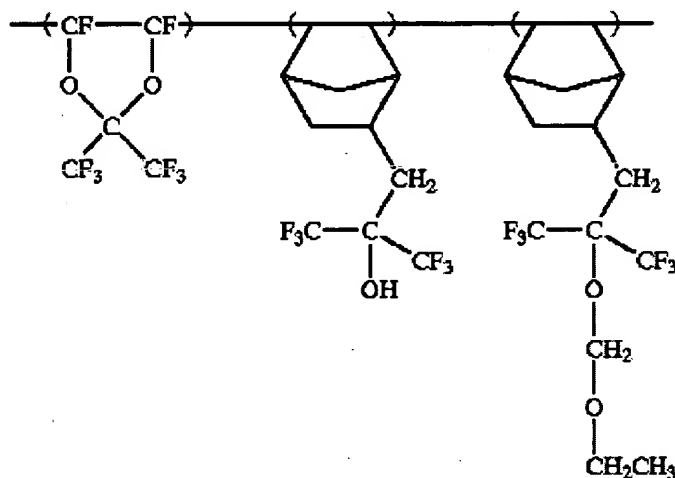
[0020] and (c) norbornen derivative having the following repeating unit:



norbornene derivative 1

EXAMPLE 8**Synthesis of Terpolymer**

[0129] The synthesized terpolymer can be represented by the following formula:

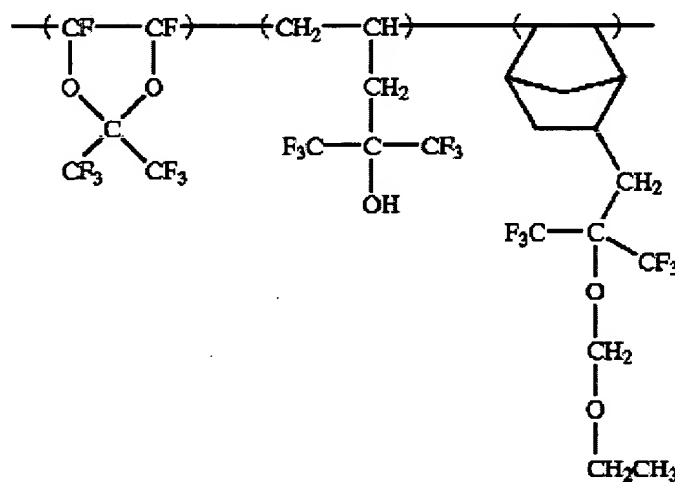


As shown in Example 8, above, the second monomer has a hexafluoro-2-propanol group as in claim 2 and the third monomer has applicant's formula V in claim 3 when R₅ in formula V is a hydrogen atom, A₁ is a single bond, R₆-R₈ are hydrogen atoms and n is 0.

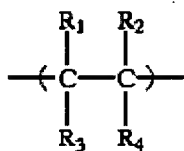
The second monomer in Example 5, below, is similar to applicant's formula I in claim 6 except it has hydrogen atoms rather than fluorine atoms on the vinyl portion of the monomer wherein R₀ in applicant's formula I is a hydrogen atom and R₁ in applicant's formula I is a perfluoroalkyl group having a hydroxy substituent (see section 34 of Kim below). The third monomer is formula V in claim 6 wherein in formula V R₅ is a methyl group substituted with an ethoxy group, A₁ is a single bond, R₆ to R₈ are hydrogen atoms, n is 0 and thus meets the limitations of R₅ defined as an alkyl group having a substituent.

EXAMPLE 5**Synthesis of Terpolymer**

[0119] The synthesized terpolymer can be represented by the following formula:



[0034] and (b) vinyl derivatives having the following repeating unit:



[0035] In the above formula, R_1 is H, Cl, or F; each of R_2 and R_3 is H or F; R_4 is H, F, CF_3 , OCF_3 , OCF_2CF_3 ,

It would have been obvious to one of ordinary skill in the art to use fluorine atoms on the vinyl portion of the monomer shown in section 34 above, rather than hydrogen atoms, with a reasonable expectation of obtaining a photoresist polymer because Kim teaches in the vinyl derivative that R_1 and R_2 may be either hydrogen or fluorine atom. Thus, changing R_1 and R_2 on the second monomer in

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Example 5 from hydrogen atoms to fluorine atoms meets the limitation of formula I in applicant's claim 6.

The motivation to make this change is the teaching of Kim which states either a hydrogen or a fluorine atom may be used to give a photoresist polymer for use with 157 nm light.

The second monomer in Example 5, above, meets the limitations of formula IV in applicant's claim 7. The third monomer meets the limitations of formula X in claim 7 when R19 and R21 are hydrogen atoms and R20 is an alkoxy group with a fluorine atom.

The composition has a photoacid generator (PAG) such as a triarylsulfonium or diaryliodonium salt (section 29) and a basic nitrogen compound such as a tertiary amine as in claim 17 (section 30). An exemplified PAG is triphenyl sulfonium nonaflate which generates a perfluoroalkyl sulfonic acid with 4 carbon atoms as in claim 18 (section 132). As shown in Example 9 the composition is exposed to 157 nm light using an F₂ laser as in claims 19 and 20 (sections 132-133).

With respect to claim 1 Kim does not teach the composition comprises a surfactant containing a silicon atom or a fluorine atom, however, the examiner takes official notice that using silicon or fluorine containing surfactants is well known in the art of photoresist compositions and their use in a composition does not impart novelty to the composition.

Allowable Subject Matter

3. Claims 4,5,8-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach a photoresist composition comprising a polymer have the monomers in these claims.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 703-308-2057. The examiner works a flexible work schedule and can normally be reached M-F between 10:00 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached at 703-308-2303.

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The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communication.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

rea
August 25, 2003

ROSEMARY ASHTON
PRIMARY EXAMINER